

## **REMARKS/ARGUMENTS**

These remarks are made in response to the Office Action of October 18, 2007 (Office Action). The response is timely filed within the 3 month shortened statutory period, and, as such, no fee is believed due. However, the Office is expressly authorized to charge any deficiencies or credit any overpayments to Deposit Account 50-0951.

In the Office Action, Claims 1, 11, and 21 were rejected under 35 U.S.C. § 103(a) as being anticipated by U.S. Patent No. 6,446,038 to Bayya et al. (hereinafter Bayya) in view of U.S. Patent No. 7,164,771 to Treurniet, et al. (hereinafter Treurniet). Claims 3-5, 13-15, and 23-25 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Bayya in view of Treurniet in further view of Non-Patent Literature "Some Waveform and Spectral Features of Vowel Roughness" by Deal, et al. (hereinafter Deal). Claims 6-10, 16-20, and 26-30 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Bayya in view of Treurniet in further view of Non-Patent Literature "Acoustic Correlates of Breathy Vocal Quality" by Hillenbrand, et. al (hereinafter Hillenbrand).

### **Amendments to the Claims**

As previously noted, all claims in the present Application were rejected based on one or more cited references. Although Applicants respectfully disagree with the rejections asserted in the Office Action, Applicants have nonetheless amended at least some of the claims to further emphasize certain aspects of the claims. However, Applicants respectfully assert that any amendment and/or cancellation of claims in this response should not be interpreted as the surrender of any subject matter. Thus, Applicants are not conceding by these amendments and cancellations that any previously submitted claims are not patentable over the references of record. Applicants' present claim amendments and cancellations are only submitted for purposes of facilitating expeditious prosecution of the present Application. Applicants therefore reserve the right

to pursue any previously submitted claims in one or more continuation and/or divisional patent applications.

In this response, Applicants have amended independent Claims 1, 11, and 21 to further emphasize certain aspects of the invention. In particular, Claims 1, 11, and 21 have been amended to recite the limitation that after processing a voice signal associated with a speaker's voice, the processed voice signal is analyzed to identify one or more attributes of the speaker's voice. The claims have also been amended to recite that the identified attributes can be compared to baseline quality attributes associated with a baseline measure of vocal quality for a human speaker and can be used to generate a measure of the quality of the speaker's voice accordingly. The term "vocal quality" is now used in the claims to clarify that the quality being analyzed is that of the speaker's voice. These attributes of the speaker's voice, not the voice signal, can include roughness and hoarseness of the speaker's voice (as recited in Claim 3), pitch and loudness of the speaker's voice (as recited in Claim 4), and breathiness of the speaker's voice (as recited in claim 6). The amendments described herein are fully supported throughout the Specification. In addition, Claims 4, 5, 7-10, 14, 15, 17-20, and 23-30 have also been amended to maintain consistency among the claims or to correct typographical errors. No new subject matter has been added by this amendment.

#### Aspects of the Claims

Prior to discussing the cited references, it may be useful to discuss certain aspects of the claims. The claims, as typified by Claim 1, provide systems and methods for diagnosing voices. That is, diagnosing the qualities of speaker's voice within a speech signal, not the quality of the speech signal. As recited in Claim 1, a method can include receiving a voice signal associated with a speaker's voice, processing the received voice signal using an auditory model, and identifying one or more attributes or features of the

speaker's voice by analyzing the processed voice signal. (See, e.g., Specification, para. [0025]-[0027]). The identified attributes or features in the speaker's voice can then be compared with one or more baseline vocal quality attributes or features in one or more baseline voice signals. (See, e.g., Specification, para. [0033]). These baseline vocal quality attributes can be associated with at least one baseline measure of vocal quality for a human speaker. (See, e.g., Specification, para. [0029]-[0032]). Finally, based upon the previous comparison, at least one measure of vocal quality of said speaker can be determined, where the measurement is relative to a baseline measure of human vocal quality. (See, e.g., Specification, para. [0033], [0039]).

**The Claims Define Over the Cited References**

As previously noted, independent Claims 1, 11, and 21 were rejected as being anticipated by Bayya in view of Treurniet. In particular, the Office Action asserts that Bayya discloses a system and method for providing an objective measure of voice quality, modified by Treurniet to encompass providing the objective measure based on an auditory model. Applicants respectfully disagree with the rejections in the Office Action and further submit that in view of all the teachings of Bayya and Treurniet, the claims, as amended, are distinctly patentable.

In particular, Bayya fails to disclose any system or method for diagnosing the quality of a speaker's voice as recited in the claims. Instead, Bayya discloses a system and method for analyzing quality of speech received over a communications system. That is, Bayya discloses that the objective of the invention is to provide a system and method for determining an amount of noise and distortion in a corrupted speech transmission. (See, e.g., Col. 1, lines 57-65.) Applicants therefore respectfully submit that the system and method of Bayya are not directed to the evaluation of the human voice in the transmission, but rather to the evaluation of the transmission. In support of

this assertion, Applicants point out that throughout the text of Bayya, no reference is made to any analysis of the underlying voice in the transmission. Instead, Bayya exclusively refers to terms such as "corrupted speech signal" and "distortion measures". Applicants respectfully submit that one of ordinary skill in the art would readily recognize that these terms are not associated with any types of measures of the quality of a speaker's voice. Instead, these are terms used in Bayya and by those of ordinary skill in the art in discussing the quality of an electronic transmission of a human voice, not the quality of the underlying voice human voice. Accordingly, the method and system of Bayya cannot be used to provide objective measures of vocal quality for a speaker and can only provide a measure of the transmitted signal being received containing the speaker's voice.

Accordingly, even if the auditory model of Treurniet is applied to the method and system of Bayya, the claimed invention would still not result. A received transmission analyzed using an auditory model disclosed by Treurniet would not result in a measure of how the speaker's speech would be received by the human ear, but rather how the transmission of the speaker's speech would be received by the human ear.

In contrast the claims, as amended, explicitly recite systems and methods for determining the objective quality of a speaker's voice using an auditory model using baseline features of human voices. That is, the quality of a voice within a transmission is measured, not the quality of the transmission itself, using baseline measures associated with human voices. Accordingly, differences between voices, not voice signals, from different speakers can be measured using an auditory model.

However, even if Bayya did provide some way to measure voice quality of the speaker, Applicants respectfully submit that the methods of Treurniet are not directly combinable with the methods in Bayya. In particular, Treurniet does not disclose or

suggest a system or method for evaluating a speech signal based on any type of speech reference vectors. Instead, Treurniet requires a reference version of the speech being analyzed. That is, both the analyzed and target speech signal in Treurniet are the same speech. (See, e.g., FIGs. 1, 2, 2B, and accompanying text.) Such an assertion is further supported by Treurniet's references to comparing processed and unprocessed signals. (See, e.g., Col. 2, lines 19-26; Col. 4, lines 35-39.) Accordingly, the auditory models of Treurniet are not configured for evaluating quality based on baseline reference vectors, but are instead configured to provide a measure of differences in measures for the target voice signal.

In contrast, the amended claims recite the limitation that the analysis of the received speech is based *not* on comparison of different versions of the same speech, but rather recite an analysis based on identifying attributes of received speech. That is, once the received speech is processed using an auditory model, specific features in the speech, not the transmission, which are characteristic of the speaker and not of the speech, are identified and measured. These identified characteristics, i.e. voice attributes, can then be compared to an objective baseline model for voice attributes and a relative measure of the quality of the speaker's voice can be provided, irrespective of the content of the speech or the method or quality of the transmission. Thus the method and system recited in the claims can be used with any voice signal received from any speaker to determine a measure of voice quality of the speaker.

Accordingly, Bayya and Treurniet, alone or in combination with any other references of record, fail to disclose, suggest, or render obvious each and every element of independent Claims 1, 11, and 21, as amended. Therefore, Applicants respectfully submit that the independent claims define over Treurniet as well as other references of record. Furthermore, as each of the remaining dependent claims depends from one of the

amended claims while reciting further limitations, the Applicants also submit that the dependent claims likewise define over the references of record.

**CONCLUSION**

Applicants believe that this application is now in full condition for allowance, which action is respectfully requested. Applicants request that the Examiner call the undersigned if clarification is needed on any matter within this Amendment, or if the Examiner believes a telephone interview would expedite the prosecution of the subject application to completion.

Respectfully submitted,

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